

WHAT IS CLAIMED AS NEW AND IS DESIRED TO BE SECURED BY
LETTERS PATENT OF THE UNITED STATES IS:

5 1. An optical pickup apparatus for
reading/reproducing data on an optical recording medium,
comprising:

 a light source configured to emit a light beam;

10 a diffracting device configured to transmit the light
beam emitted from the light source, and to diffract a
light beam reflected from the optical recording medium;

15 an optical device having a reflecting portion and a
transmitting portion, configured to reflect one part of
the light beam emitted from the light source to the
diffracting device by the reflecting portion and to
20 transmit another part of the light beam emitted from the
light source to the optical recording medium by the
transmitting portion, and to transmit the light beam
reflected from the optical recording medium to the
diffracting device by the transmitting portion;

 a photodetecting device configured to detect the
light beam reflected from the optical recording medium
through the optical device and the diffracting device, for
signal light detection; and

25 wherein the diffracting device includes a diffracting
portion to diffract the one part of the light beam
reflected by the reflecting portion of the optical device
to the photodetecting device for monitor light detection
of the light source.

30 2. The optical pickup apparatus of claim 1, wherein
the diffraction device is a transmitting type diffraction
device.

35 3. The optical pickup apparatus of claim 1, wherein
the optical device is integrated with the diffracting
device.

40 4. The optical pickup apparatus of claim 1, wherein
the diffracting device is a polarization hologram whose
diffracting function is different according to a
polarization state of the incident light beam, and
includes a polarization hologram portion configured to
45 diffract the light beam reflected from the optical device
to the photodetecting device for monitor light detection.

 5. An optical pickup apparatus for
reading/reproducing data on an optical recording medium,

comprising:

light sources configured to emit light beams of different wavelengths;

5 a diffracting device configured to transmit the light beams emitted from the light sources and to diffract light beams reflected from the optical recording medium;

10 an optical device having a reflecting portion and a transmitting portion, configured to reflect one part of the light beams emitted from the light sources to the diffracting device by the reflecting portion and to transmit other parts of the light beams emitted from the light sources to the optical recording medium by the transmitting portion, and to transmit the light beams reflected from the optical recording medium to the
15 diffracting device by the transmitting portion;

a photodetecting device configured to detect the light beams reflected from the optical recording medium through the optical device with reflecting portion and the diffracting device, for signal light detection; and

20 wherein the diffracting device includes plural diffracting portions, in which each of the diffracting portions corresponds to one of the different wavelengths, to diffract the respective parts of the light beams reflected by the reflecting portion of the optical device to the photodetecting device, so as to be detected on the
25 photodetecting device for monitor light detection of each of the light sources.

30 6. The optical pickup apparatus of claim 5, wherein the reflecting portion of the optical device includes plural reflecting portions arranged at positions corresponding to the light beams of the plural wavelengths, and the plural diffracting portions of the diffracting device are arranged at positions corresponding
35 to the plural reflecting portions of the optical device respectively, and the light beams of different wavelengths reflected from the plural reflecting portions of the optical device are diffracted by the plural diffracting portions of the diffracting device to the photodetecting
40 device for monitor light detection of each of the light sources.

45 7. The optical pickup apparatus of claim 5, wherein the optical device is integrated with the diffracting device.

8. The optical pickup apparatus of claim 5, wherein the diffracting device is a polarization hologram whose

5 diffracting function is different according to a polarization state of the incident light beam, and includes plural polarization hologram portions configured to diffract the light beams of the different wavelengths reflected from the optical device to the photodetecting device for monitor light detection.

10 9. The optical pickup apparatus of claim 3 or claim 7, wherein a section of the diffracting device at a side of the optical device form a section of bilateral asymmetry.

15 10. An optical pickup apparatus for reading/reproducing data on an optical recording medium, comprising:

light emitting means for emitting a light beam;
diffracting means for transmitting the light beam emitted from the light emitting means, and for diffracting a light beam reflected from the optical recording medium;
20 optical means having a reflecting portion and a transmitting portion, for reflecting one part of the light beam emitted from the light emitting means to the diffracting means by the reflecting portion and for transmitting another part of the light beam emitted from the light emitting means to the optical recording medium by the transmitting portion, and for transmitting the light beam reflected from the optical recording medium to the diffracting means by the transmitting portion;
25 detecting means for detecting the light beam reflected from the optical recording medium through the optical device with reflecting portion and the diffracting device, for signal light detection; and

30 wherein the diffracting device includes a diffracting portion to diffract the one part of the light beam reflected by the reflecting portion of the optical means to the detecting means for monitor light detection of the light emitting means.

40 11. An optical pickup apparatus for reading/reproducing data on an optical recording medium, comprising:

light emitting means for emitting light beams of different wavelengths;
diffracting means for transmitting the light beams emitted from the light emitting means and for diffracting light beams reflected from the optical recording medium;
45 optical means having a reflecting portion and a transmitting portion, for reflecting parts of the light

beams emitted from the light emitting means to the diffracting means by the reflecting portion, and for transmitting other parts of the light beams emitted from the light emitting means to the optical recording medium by the transmitting portion, and for transmitting the light beams reflected from the optical recording medium to the diffracting means by the transmitting portion;

detecting means for detecting the light beams reflected from the optical recording medium through the optical device and the diffracting device, for signal light detection; and

wherein the diffracting means includes plural diffracting portions, in which each of the diffracting portions corresponds to one of different wavelengths of said light beams, to diffract the parts of the light beams reflected by the reflecting portion of the optical means to the detecting means, so as to be detected on the detecting means for monitor light detection of each of the light emitting means.

12. An optical data recording/reproducing apparatus for recording/reproducing data on an optical recording medium, comprising:

a light source configured to emit a light beam;

a diffracting device configured to transmit the light beam emitted from the light source, and to diffract a light beam reflected from the optical recording medium;

an optical device having a reflecting portion and a transmitting portion, configured to reflect one part of the light beam emitted from the light source to the diffracting device by the reflecting portion and to transmit another part of the light beam emitted from the light source to the optical recording medium by the transmitting portion, and to transmit the light beam reflected from the optical recording medium to the diffracting device by the transmitting portion;

a collimating lens configured to collimate the light beam transmitted through the transmitting portion of the optical device with reflecting portion;

an objective lens configured to focus the light beam from the collimating lens onto the optical recording medium;

a photodetecting device configured to detect the light beam reflected from the optical recording medium through the objective lens, the collimating lens, the optical device, and the diffracting device, for signal light detection; and

wherein the diffracting device includes a diffracting

portion to diffract the one part of the light beam reflected by the reflecting portion of the optical device to the photodetecting device, so as to be detected on the photodetecting device for monitor light detection of the light source.

13. An optical data recording/reproducing apparatus for recording/reproducing data on an optical recording medium, comprising:

10 light sources configured to emit light beams of different wave lengths;

a diffracting device configured to transmit the light beams emitted from the light sources and to diffract light beams reflected from the optical recording medium;

15 an optical device having a reflecting portion and a transmitting portion, configured to reflect parts of the light beams emitted from the light sources to the diffracting device by the reflecting portion, and to transmit other parts of the light beams emitted from the light sources to the optical recording medium by the transmitting portion, and to transmit the light beams reflected from the optical recording medium to the diffracting device by the transmitting portion;

20 a collimating lens configured to collimate the light beams transmitted through the transmitting portion of the optical device;

an objective lens configured to focus the light beams from the collimating lens onto the optical recording medium;

30 a photodetecting device configured to detect the light beams reflected from the optical recording medium through the objective lens, the collimating lens, the optical device and the diffracting device, for signal light detection; and

35 wherein the diffracting device includes plural diffracting portions, in which each of the diffracting portions corresponds to one of different wavelengths of the light beams, to diffract the respective parts of the light beams reflected by the reflecting portion of the optical device to the photodetecting device, so as to be detected on the photodetecting device for monitor light detection of each of the light sources.

14. An optical data recording/reproducing apparatus for recording/reproducing data on an optical recording medium, comprising:

light emitting means for emitting a light beam;

diffracting means for transmitting the light beam

emitted from the light emitting means, and for diffracting a light beam reflected from the optical recording medium;

5 optical means having a reflecting portion and a transmitting portion, for reflecting one part of the light beam emitted from the light emitting means to the diffracting means by the reflecting portion and for transmitting another part of the light beam emitted from the light emitting means to the optical recording medium by the transmitting portion, and for transmitting the light beam reflected from the optical recording medium to the diffracting device by the transmitting portion;

10 collimating means for collimating the light beam transmitted through the transmitting portion of the optical means;

15 focusing means for focusing the light beam from the collimating means to the optical recording medium,;

20 detecting means for detecting the light beam reflected from the optical recording medium through the collimating means, the focusing means, the optical means, and the diffracting means, for signal light detection; and

25 wherein the diffracting means includes a diffracting portion to diffract the part of the light beam reflected by the reflecting portion of the optical means to the detecting means, so as to be detected on the detecting means for monitor light detection of the light emitting means.

15. An optical data recording/reproducing apparatus for recording/reproducing data on an optical recording medium, comprising:

30 light emitting means for emitting light beams of different wave lengths;

35 diffracting means for transmitting the light beams emitted from the light emitting means and for diffracting light beams reflected from the optical recording medium;

40 optical means having a reflecting portion and a transmitting portion, for reflecting parts of the light beams emitted from the light emitting means to the diffracting means by the reflecting portion and for transmitting other parts of the light beams emitted from the light emitting means to the optical recording medium by the transmitting portion, and for transmitting the light beams reflected from the optical recording medium to the diffracting means by the transmitting portion;

45 collimating means for collimating the light beams transmitted through the transmitting portion of the optical means with reflecting portion;

focusing means for focusing the light beams from the

collimating means to the optical recording medium;

detecting means for detecting the light beams reflected from the optical recording medium through the collimating means, the focusing means, the optical means, and the diffracting means, for signal light detection; and

wherein the diffracting means includes plural diffracting portions, in which each of the diffracting portions corresponds to one of different wavelengths of the light beams, the respective light beams reflected by the reflecting portion of the optical means to the detecting means, so as to be detected on the detecting means for monitor light detection of each of the light emitting means.

16. An optical data recording/reproducing method for recording/reproducing data on an optical recording medium, comprising:

emitting a light beam by a light source;

transmitting the light beam emitted from the light source and diffracting a light beam reflected from the optical recording medium by a diffracting device;

reflecting one part of the light beam emitted from the light source to the diffracting device by a reflecting portion of an optical device and transmitting another part of the light beam emitted from the light source to the optical recording medium by a transmitting portion of the optical device, and transmitting the light beam reflected from the optical recording medium to said diffracting device by the transmitting portion of the optical device;

collimating the light beam transmitted through the transmitting portion of the optical device by a collimating lens;

focusing the light beam from the collimating lens to the optical recording medium by an objective lens;

detecting the light beam reflected from the optical recording medium through the objective lens, the collimating lens, the optical device, and the diffracting device, for signal light detection by a photodetecting device; and

diffracting the part of the light beam reflected by the reflecting portion of the optical device to the photodetecting device, so as to be detected on the photodetecting device for monitor light detection of the light source.

17. The method according to claim 16 further comprising using said photodetecting device to control output of said light source.

18. An optical data recording/reproducing method for recording/reproducing data on an optical recording medium, comprising:

- 5 emitting light beams of different wavelengths by light sources;
- transmitting the light beams emitted from the light sources and diffracting light beams reflected from the optical recording medium by a diffracting device;
- 10 reflecting parts of the light beams emitted from the light sources to the diffracting device by a reflecting portion of an optical device and transmitting other parts of the light beams emitted from the light source to the optical recording medium by a transmitting portion of the optical device, and transmitting the light beams reflected from the optical recording medium to said diffracting device by the transmitting portion of the optical device;
- 15 collimating the light beams transmitted through the transmitting portion of the optical device by a collimating lens;
- 20 focusing the light beams onto the optical recording medium by an objective lens;
- detecting the light beams reflected from the optical recording medium through the objective lens, the collimating lens, the optical device, and the diffracting device, for signal light detection by a photodetecting device; and
- 25 diffracting light beams reflected by the reflecting portion of the optical device to the photodetecting device through plural diffracting portions, in which each of the diffracting portions corresponds to one of the different wavelengths, so as to be detected on the photodetecting device for monitor light detection of each of the light sources.
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- 35 19. The method according to claim 18 further comprising using said photodetecting device to control output of said light source.